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LETTERS,

CONTAINING

THE OUTLINES OF A PLAN

FOR IMPROVING

THE NOTES

OF THE

THE BANK OF ENGLAND.

TO

JEREMIAH HARMAN, ESQ.

SIR,

I PRESUME to submit the following ideas to your attention with considerable diffidence, and yet with the fullest persuasion that the plan here proposed would be attended with great advantage to the Public at large, and would very materially lessen, if not entirely obviate, the painful duty the Governors and Directors have to perform in attempting to repress the forgeries now so frequently committed upon the Bank of England.

It appears that some improvement in the mode of forming the Notes is peculiarly desirable at the present period; both on account of the loss which individuals so frequently sustain by the accidental possession of a forged note, and also by the unpleasant discussions which ensue respecting the right of the Bank to retain the false note; a claim which most persons on a dispassionate consideration would be willing to concede, and yet which many under the irritation of the loss, and consequent trouble, appear disposed to contest.

I have been induced to trouble you with the following sketch, presuming the Directors are desirous to obviate these numerous, and perhaps increasing, evils; and that they will lend an attentive ear to a plan which promises to remove them.

If it be necessary to state any additional or new feature which renders this change more peculiarly desirable at the present time, it is the recent invention of the art of Lithography, or printing from drawings on stone; which is performed in the following manner:—

A stone composed of an absorbent earth, is found in the quarries near Bath; on the surface made flat, and moderately polished, the subject is drawn, either with a pen or brush, with a prepared ink or crayon; the stone is then dipped in water till thoroughly saturated, it is then taken to a rolling, or other press, and dabbed or beat with the common balls and ink, used by Letter-press Printers: the part of the stone which is not covered with the drawing being wet, rejects the printer's ink, which adheres only to the prepared ink used in the drawing; it is then passed through the press. By this mode, from 500 to 800 impressions may be taken off the stone, without any perceptible variation in their appearance.

This art, which at present is but in its infancy, will, from its great simplicity, and from being accessible to every artist, soon become general.

It has been supposed that there are from 10 to 12,000 persons in England, capable of imitating the notes; how then shall we estimate their number, when every person who can use a pen, and has skill enough to copy the vignette, may with a piece of stone and a small press produce as good imitations as are now obtained by the more circuitous process of engraving.

But a skilful artist may go further: he may use a real note, and actually print the stone from it without taking any copy; and thus baffle the judgment of the most skilful inspector.

Among the various plans which have been devised for increasing the difficulties of imitation, that of introducing a vignette or design, of very superior execution, appears at first sight the most feasible and secure. But the friction of the printer's hand, soon effaces the finer touches and character, which distinguish the work of the superior artist; and from the number of plates required, it would be impossible to get them engraved by first rate artists, without incurring a most enormous expense, though this plan might be serviceable to a country Banking House, whose notes are confined to a local circulation.

But if the use of copper plate engraving, of the first order of execution, is thus objectionable, how much more so is that style which is level to the talents of every writing engraver; and those plates, all of which are copies, which are continually wearing out, and which require the slow and operose process of the rolling press. I must (if such freedom of expression may be allowed,) in order to lay the foundation for the new system, explode the copper plate engraving, with all its appendages of engravers, and assistant engravers, and keepers of plates, and dozens of printers, and superintendants of printers.

In forming the New System, the following objects have been chiefly kept in view:

1.—To make the Plate, or Original, as difficult of execution as possible.

2.—To have but one original for each value of note.

3.—To reduce the number of persons employed in and about the printing.

I beg to premise, that in the New System, no pledge of absolute inimitability is formally held out, since it is impossible to assign a final limit to the imitative powers of the mind. All that is proposed, is to approach the present boundary as nearly as possible; and since this object is the most important, and upon it the whole system may be said to depend; particular attention is requested to the steps by which we intend increasing the difficulties of imitation, to the utmost degree known at present. And it is presumed, that if it shall be shown that the difficulties of practical imitation are very much increased, that the system will be established; although a skilful artist may, by labour and several operations, be able to produce an incomplete imitation.

1. To make the Plate, or Original, as difficult of execution as possible.

The most obvious mode to effect this object, is to make use of engraving in relief, or wood cutting; the number of wood cutters being much less than that of engravers upon copper, and, it is very probable, that there are not ten wood engravers who would have any chance of rivalling the work of the first artist in that line. So that if the original plate, or block, was cut by the most approved artist, the number of persons capable of imitating it are so few, as hardly to merit attention.

But the original plate, or block, I propose, is cut in relief by machinery which combines mathematical exactness, when required, with the utmost freedom and irregularity of any design.

The cross hatches, which cannot be cut in wood without great labour and skill, are produced by it with such facility, that they may be introduced whenever required; and that with a precision which the best wood cutter *would not be able perfectly to imitate.*

In order to guard more effectually against imitation by copper engraving, it is proposed to introduce, in various parts of the plate, irregular white lines upon a black ground, which is very difficult, if not impossible to produce on copper; so that the plate will unite the two great difficulties of copper and wood engraving, while the artful intermixture and joining of the black and white lines, will present an insurmountable obstacle to their imitation by separate impressions from copper and wood.

Another important feature in the plan is, that when the original block is completed, and the order of the machine deranged, a second block cannot be cut to resemble the first with precision; and thus the perfect imitation of the original is secured even against the possessor of the machines.

2. The second object, namely, that of having but one original Plate for each Note, is obtained by a new and improved process of Stereotype, which enables me to produce *perfect fac-similes* of any engraving in relief, either in wood or metal, without the slightest injury to the original; which may remain as the prototype of the printing plates for centuries, or until the gradual improvement and diffusion of the arts render some new advance necessary on the part of the Bank.

By this important art a perfect similarity is insured in all the printing plates, which are composed of a metal which will probably work off 200,000 impressions without perceptible wear.

3. To reduce the number of persons employed in and about the printing.

This I propose to do by the use of Cowper's Patent Cylinder Press, which prints from 600 to 1200 impressions per hour; and the printing may be still further facilitated by the use of paper capable of containing six or more Notes on each sheet.

The printer alone who lays the paper on the Press, need witness the operation of the machine, as the labourer who puts it in motion may be in another room; and the paper, when printed, may be conveyed to another room, where a confidential person may receive it.

It is presumed that the advantages of having fewer persons employed about the production of the Notes, are too obvious to need comment; it is proper to add, that it is not in the power of the printer to obtain possession of the printed paper, it being immediately carried by the action of the press to the receiver; and the number of sheets so conveyed may be indicated by a dial plate connected with the press. If it is required, the paper may be dried in its passage to the receiver, without resorting to any complicated contrivance.

Plates to a sheet 6
Impressions per hour 1000

6000
6 hours per diem.

36,000 Notes per diem of six hours, produced by a printer, a labourer, and receiver.

A comparison of this with the quantity of labour required to produce the same number of Notes in the present mode, must leave a balance very favourable to the economy of the Cylinder Press; while it should be remembered, that the originals once made, the great expence of engraving ceases; the only additional cost being the occasional casting of new printing plates, which is less than engraving, and which plates are more durable than copper, perhaps in the ratio of 20 to 1.

I am, Sir,

your's, &c. &c.

TO

CORNELIUS BULLER, ESQ.

Sir,

My time having been entirely employed in the completing of our new Flat Machine for printing, I have not been able to answer your favour earlier; nor can I now lay before you my thoughts in so perfect and arranged a manner as I could wish; for which however, I claim your indulgence, as the subject is one to be practically worked out, and is not merely a theme for writing.

The further consideration of the means whereby I propose to render the forging and uttering of false notes more difficult, has only served to convince me of their efficacy, and I entreat the Committee not to give up the subject without the fullest consideration; for should I fail in convincing them of its merits, it will only be through my inability to convey the true idea.

But of this I feel confident, that it may be demonstrated that the adoption of the new System would be a very material and important improvement, in that it would very considerably increase the difficulties of making and uttering, forged notes; and that it would very materially lessen the trouble and expense of the printing department.

Whether it be possible or not to produce an original of a note, or any thing else, which can never be imitated, is an undeterminable question of speculation; the consideration of which, is of no practical moment in the present case. I presume, the view which the Committee will take of the subject is, whether the New System possesses improvements of sufficient value to justify the making so great a change in the mode of printing. And I will again briefly state its principal features, upon which, a little volume might easily be written; and I just beg to notice, that when the notes so printed, are sent into the world, if required, a concise view of the System might be given; which would completely shew that the Bank had scientifically considered the subject, and had taken every precaution which human prudence and foresight could devise, to effect their important object.

The principal feature in the New System is, the having but one ORIGINAL PLATE OR BLOCK; upon the difficulty of imitating which, the whole system depends.

In the formation of this original, I propose to give it a plain and obvious general character; but which plain and obvious character, can be only successfully* imitated, by using the very same means and processes, by which the original itself was made.

Any plan depending SOLELY upon a secret process, or upon the extreme difficulty of the engraving, is not to be relied upon; but a secret process, and great skill in engraving, are useful auxiliaries, when combined on the true principle —namely, that of such secret processes and modes of engraving being very expensive.

The following scale, perhaps, may not unaptly illustrate the plan; in which the probabilities of forgery are estimated by the expense:

If the Plate cost	*the chances of imitation are as*
£1	1000
10	100
100	10
1000	1

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* I say successfully imitated, for I believe it very possible, that notes may have been passed which, so to speak, were very little better than bits of white-brown paper; but it is impossible to guard against this. Among the very lower orders, whose visual powers of discernment are very limited, and who very seldom have the pleasure of seeing a note, any thing may pass; it would be impossible for a blind person to distinguish between a true and a false note; but our object must be to PROVIDE FOR THE GENERAL SECURITY WITHOUT REGARDING THE EXCEPTION.

Another security against imitation is afforded in the almost improbability of any one person uniting in himself the various kinds of knowledge, and the different implements, proper for the attempt; and unless he possessed all the tools and uncommon manual skill, (with which it may be observed he could get an ample living,) it would be requisite to employ others; and they must necessarily know the purpose for which they were employed, as also their workmen (and again it must be observed, that the few men capable of assisting him, must possess implements to the amount of several hundred pounds.) Let this be compared with the act of forgery as now committed: —a man retires into a garret; the piece of copper and graving tools, he carries about him for concealment; he then buys a rolling press for 5*l.* for the ostensible purpose of printing message cards; and thus, by the want of a little science in the manufacture of the real representative of property, is a half-taught artist able to deceive the public, and to draw down upon himself the severe punishment of the law; to which fatal end the easy commission of the crime, has so to speak, led him.

Now during the process of committing the forgery, which is a secret act, the man receives no checks whatever, but from his own feelings or conscience; and those who know most of the human mind, will readily acknowledge, that the pressure of want will very much bias and warp the judgment; so that the bad moral quality of an action will often be covered by the plea of necessity.

On the other hand, the man is checked in every part of his progress—the implements required (supposing he is about to do the whole unassissted) are very expensive, and occupy a considerable portion of room:—they must also be of the most accurate and delicate workmanship. In getting them made, he is liable to a thousand enquiries from the workmen or artists who construct them, and who are always very prying and curious; they would require a considerable time to make—he must then practise for a long time, and become an excellent workman; this he can hardly be without instruction, while the ever recurring enquiry, "What do you want them for?" is ready to cause his detection.

He must then acquire a very superior degree of skill in wood cutting by hand, to rival the vignettes; and also obtain considerable skill in copper engraving (much more than is required at present to imitate a Note.)

We are now to suppose a man, with this knowledge of wood and copper engraving, set up with the necessary machines to the value of several hundred pounds, and with sufficient skill to use them; he then commences his attempts to imitate the Note, and he will then have to construct from 100 to 150 additional tools, each of which, I may safely affirm, he could not make himself for less than three pounds, and I am asked, by one of the best workmen in London, more than double that sum for each. But supposing that expense does not deter him, it is almost a mathematical impossibility that he should construct them mathematically similar to mine, which is indispensible, for the slightest deviation would immediately be discovered.

But supposing them made, he has still greater difficulties to overcome in arranging them upon the block, so as to make a perfect imitation; and unless his imitation be perfect in every part, it is as a thousand to one that it will be a little out in every part, which would be immediately discoverable by the eye. For my ORIGINAL, although possessing a plain and obvious general character, will contain thousands of parts which may be used as private marks, so that every person may have his own private marks in which he would immediately detect the slightest alteration. I cannot, without actually shewing the Plate, express how slight a deviation would be discernable to the eye. This extreme minuteness can only be obtained by a plan in which there is but one original. For if I were required to make a copy, having all the tools in my possession, with which I had made the first, I could not make a perfect copy; at least the chances against its being so are more than 10,000 to 1.

I do not advert to the other mode of imitation, which is to be obtained by procuring the assistance of a number of workmen in the separate arts required, since it would be idle to suppose that a number of persons would unite in committing a felony for the benefit of another; or that such a thing could be kept secret where several are privy to it; each knowing, as he must, that a liberal reward would attend his giving information; it should, however, be remembered that supposing each art has contributed its quota, and in so doing they have the same difficulties to overcome, the parts are then to be united together, and that in thousands of places, without error—but the impossibility of doing this cannot sufficiently be *felt* without seeing the original.

I presume that it must be apparent, that provided the expense be permitted, sufficient security can be attained against the imitation of the Original by the same means as those by which it was constructed. The question naturally occurs, but cannot it be imitated by other means? Upon this question we have, bestowed the most anxious and severe investigation, and it should be observed at once, that we have no hesitation in saying, that it is one hundred times more difficult than to imitate the present Notes, were our mere dictum sufficient to satisfy the enquirer; but upon this point, as upon every other part of the plan, I wish the Committee itself to judge, and be fully convinced; and I beg to remark, first,

That in order to a successful imitation, a person must be an engraver both on copper and wood.

That he must possess a mathematical correctness of hand, capable of rivalling machinery (which has never yet been possessed by any man.) And that the printing of the Note must be performed at two operations, in which a perfect register, or co-incidence of every part must be effected—which we conceive utterly impossible, as one printing must be in copper, and the other in letter-press.

Also, it is absolutely necessary that the mind of the forger should possess a most astonishing faculty of observation, in order to acquire the exact arrangement of the various parts which form, so to speak, the private marks; and, I think, if we investigate this closely, we shall find both from reasoning, and the actual experience of the Bank itself, that such powers of attention have never yet, nor are likely, to be possessed by the disturbed mind of a man who is committing an act of fraud, which exposes him to capital punishment.

I take it for granted that the Inspectors can really do what they profess to do, namely, to *distinguish* a forged Note from a true one. This, I presume, as it is done by inspection, must be both from the general appearance and from some private marks, which, associated with dates, and other known circumstances, enables them to say —this Note is forged—I SEE it to be forged.

A forger then has not sufficient observation to imitate the present Note perfectly, for he cannot deceive the Inspector, though he does the public. How then will he seize the perfect arrangement of thousands of parts, each, or all of which, may form discriminating signs to every individual who takes a Note. And this physical difficulty of imitation applies with equal force to the man who possesses the machinery. With one original, and that crowded with expensive labour, in the manner I propose, the Bank and the Public will have as great a security against fraud *as the nature of things will admit.*

And we are precisely in this dilemma, either to acknowledge that the original cannot be imitated, —or that the Inspector cannot tell a forged Note from a true one;—or that the man who cannot imitate the present Note, can imitate one a hundred times more difficult.

I am, Sir,

Your's, &c. &c.

TO

JEREMIAH HARMAN, ESQ.

SIR,

HAVING had the honour of addressing to you a letter on the subject of improving the Bank Notes, as also another to C. BULLER, Esq. which letters have been referred to the House Committee; I once more presume to urge on yourself, and the Directors, the propriety of a more full investigation of the system proposed; inasmuch as by the acknowledgement of the gentleman who communicated with myself and Mr. Cowper, my partner, from the Committee, it may be considered in many respects, the most perfect plan which has yet been submitted to the Bank. I do not hesitate to say that it possesses, in an eminent degree, all the desiderata required; and that its adoption would go further towards removing the possibility of forgery than any other mode of printing, as the difficult parts of any other plan can be combined in my plate, with the work I already design.

It cannot have escaped the penetration of the Committee, that any plan of difficult engraving without the power of multiplying the plates themselves, as well as the impressions, must at first sight, be pronounced inefficient; for how is a copy of an inimitable plate to be obtained, when the plate itself is worn out? and without such copy, how is a perfect similarity in all the printed notes to be obtained? which is one of the most important desiderata. But supposing that a mode of difficult engraving, may have been devised, by which a number of plates can be made exactly to the same pattern; that plan must be less secure than the ORIGINAL now proposed, of which it is utterly impossible to make a second or copy, as it depends not only on the difficult execution of each individual part, but also on their combination and arrangement, which is arbitrary, and in some degree fortuitous.

I cannot pass over this feature of the System, without noticing the great security afforded by this difficulty of arrangement; which is not less than the difficulty of constructing the engraved parts themselves; for it may be affirmed, that we could not, having all the parts (of which the original is composed,) re-arrange them so as to print, or to form another original with any chance of obtaining perfect similarity; and perfect similarity is indispensable, for any thing less, deranges all the private marks; which would render the detection of a forged note inevitable. While it should ever be remembered, that the artist who engraves a forged plate, must produce a sufficient degree of similarity to satisfy his own mind, before he would venture to risk his life by uttering an impression.

A doubt seemed to exist in the minds of the Committee, as to whether the public would compare the notes offered in circulation, with a known good note obtained from the Bank itself. On this point, it may be observed, that the duty of the Bank to render their notes difficult of imitation, is quite distinct from the question, as to whether the public will examine them or not.

That Bankers and persons in the habit of receiving large quantities of notes, will pass them without examination, is possible; but the practical question is, whether publicans, bakers, and the lower class of shopkeepers, (the channels through which forged notes are usually introduced into circulation,) will prefer the risk of loss, to the slight trouble of examination; which certainly cannot be greater than the ringing, examining, and weighing, coin; or than the writing a name and address on the note, which many persons now do. It is by no means certain, that even Bankers and the public at large, will take the new notes without examination; for the trouble even in receiving large sums, would be much less than formerly, when a gold circulation prevailed;—the present practice cannot decide the question, as examination now is perfectly useless, there being no *criterion of forgery.*

When the communication with the Committee before alluded to took place, we were given to understand that the Committee had not abandoned our suggestions, but proposed that a specimen of the Note should be furnished at our expense, before the Bank could proceed further in the business.

The principal object of my present communication is, to request that the Bank would appropriate a sum not exceeding 1500*l.* to enable me to form a specimen, which, if approved, would be the Original itself, so that the first outlay in this case would not be lost. And however bold it may appear to make such a request, it is not the least valuable feature in the system, that a perfect specimen or note cannot be produced without incurring so heavy an expense.

If the Bank should on maturely considering the various features of the new system (whose economy alone entitles it to their attention) think fit to vest such a sum in the Committee or in Trustees—we will devote the time and attention requisite to carry the plan into effect; which as it must necessarily interfere with our regular pursuits, will be on our parts, a sacrifice of equal value with that requested from the Bank.

In order to afford a compendious view of the subject, I subjoin a synopsis of the present system and the system now proposed, from which it will appear that the present system possesses none of the desiderata, and that the new system possesses them *all.*

I am, Sir,

Your's, &c. &c.

SYNOPSIS

Of the Present System and the New System of BANK NOTES.

The Desiderata in the Construction of a Note are,
DIFFICULTY, EXPENSE, AND SIMILARITY.

Difficulty	To place it beyond the reach of the generality of Artists.
Expense	To place it beyond the reach of the poor and necessitous.
Similarity	That a known good note may be a standard of comparison for the Public, and thus serve as a *Criterion of Forgery*.

Present System.

Very Easy	Any writing engraver can execute them.
	May be imitated with pen and ink, or camel's hair pencil.
	May be multiplied by Lithography.
Very Cheap . . .	About Five Pounds will cover the whole expense.
Not Similar . . .	The plates are constantly wearing out; no two plates are perfectly alike; there is, therefore, no standard for comparison, and consequently, *No Public Criterion of Forgery*.

New System.

Very Difficult .	Requires several distinct Arts, and each of these in their highest perfection, combined with inconceivable power of observation, and also attended with insuperable difficulties of arranging the parts.
Very Expensive .	Requires machinery and tools to the amount of One Thousand Pounds.
Perfectly Similar .	Every Note proceeds from one original, which cannot wear out.—Thus every known good note affords a *Criterion of Forgery*.

The plans hitherto proposed have possessed but part of the Desiderata: the greater number have possessed merely "Difficulty;" some few "Difficulty and Expense;" but they are all utterly inefficient, without "Perfect Similarity," for without "Perfect Similarity," there can be no Public Criterion of Forgery.

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